

12/21/17 "Intelligence plus character, that is the true goal of education."-Martin Luther King Jr.

HW: "2017 A2 L34 Finding Equations of Polynomials" finish

AIM: How do we write Polynomial Equations??

Warm Up: (Do Now #3 on the handout)

Find an equation for a cubic polynomial that has zeros of -2, 1 and 3.

← 3 roots

$$P(x) = (x+2)(x-1)(x-3)$$

1. Determine the equation of a quadratic <sup>2nd degree</sup> function whose roots are -3 and 4 and which passes through the point (2, -50).

$$y = a(x+3)(x-4)$$

$$-50 = a(2+3)(2-4)$$

$$-50 = a(5)(-2)$$

$$\frac{-50}{-10} = \frac{a(-10)}{-10}$$

$$a = 5$$

$$y = 5(x+3)(x-4)$$

We need to find a value to multiply by in order to be certain it goes through the given point

3. Create the equation of a cubic, in standard form, that has a double zero at -2 and another zero at 4.

4. The cubic has a y-intercept of 16.

Point (0, 16)

$$y = a(x+2)(x+2)(x-4)$$

$$y = a(x+2)^2(x-4)$$

$$16 = a(0+2)^2(0-4)$$

$$16 = a(4)(-4)$$

$$\frac{16}{-16} = \frac{a(-16)}{-16}$$

$$a = -1$$

$$y = -1(x+2)^2(x-4)$$

$3^{\text{rd}}$  degree

7. Find the **cubic** polynomial whose graph passes through the points  $(2,0)$  and  $(4,6)$  and is **tangent** to the x-axis at the origin.

$(0,0)$   
double  
zero @  $x=0$

zero  
@  $x=2$

point

touches  
but does  
not cross  
even  
root

$$y = a(x-2)(x+0)^2$$

$$y = a(x-2)(x)^2$$

$$6 = a(4-2)(4)^2$$

$$6 = a(2)(16)$$

$$\frac{6}{32} = \frac{a(32)}{32}$$

$$a = \frac{6}{32} = \frac{3}{16}$$

$$y = \frac{3}{16} x^2 (x-2)$$

10) quadratic zero @  $x = -3$  zero  
turning point at  $(-1, -16)$  point

2<sup>nd</sup> degree

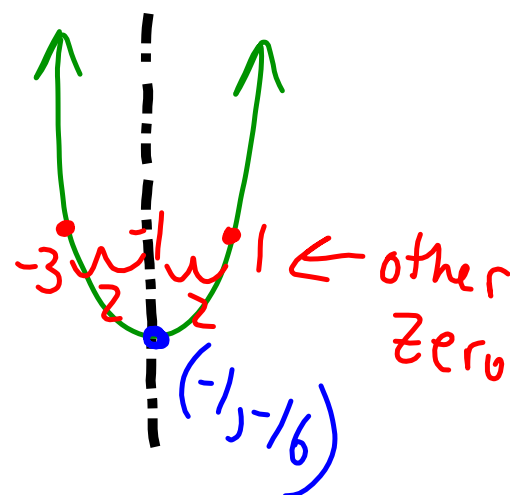
$$y = a(x+3)(x-1)$$

$$-16 = a(-1+3)(-1-1)$$

$$-16 = a(2)(-2)$$

$$\frac{-16}{-4} = a \frac{(-4)}{-4}$$

$$a = 4$$



$$y = 4(x+3)(x-1)$$